TRANSURANIC WASTE

What is it?

You may hear it called "nuclear garbage" or "plutonium-contaminated waste" but "transuranic waste" is the official name of a specific type of radioactive waste created from processing of nuclear materials.

Transuranic refers to the "heaviness" of the element. Elements with an atomic number greater than that of uranium (92) are considered transuranic. "Trans" means "beyond," so transuranic can be thought of as "beyond uranium." Transuranic elements include plutonium, americium, curium and neptunium. They're man-made elements created during nuclear reactor operations. Some transuranic elements are used in production of nuclear weapons, spacecraft batteries, and consumer products. The remaining unusable material containing transuranic elements is transuranic waste.

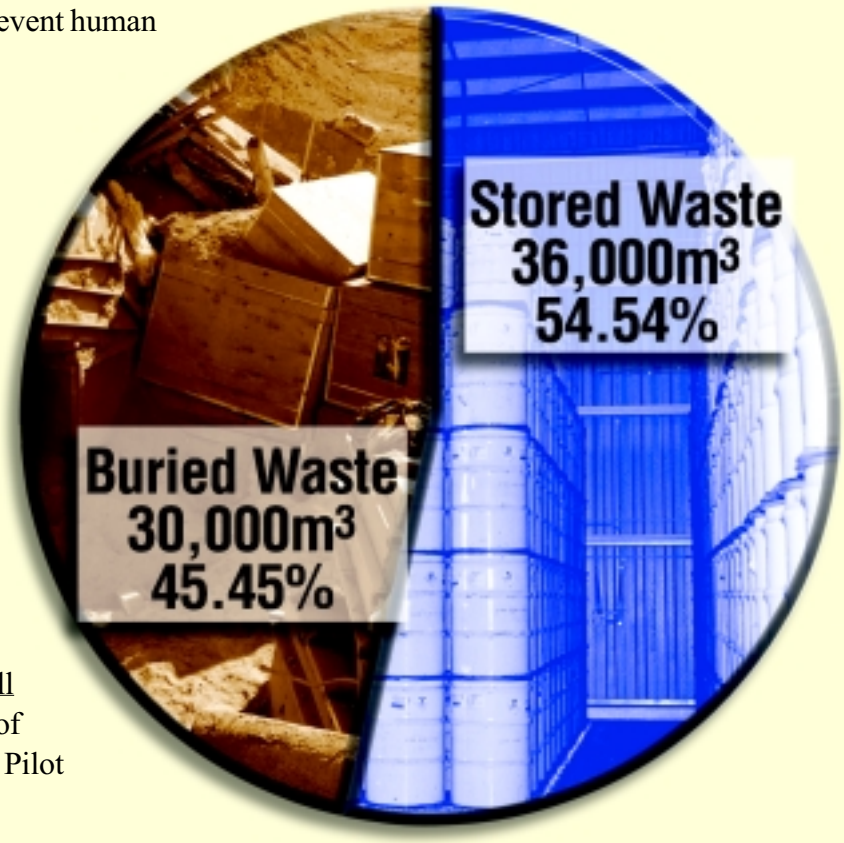
Most transuranic waste results from production of nuclear weapons. Transuranic waste often looks like ordinary items one would find at any industrial site: tools, gloves, protective suits, and tarps. Some transuranic waste is contaminated soil or sludge.

Because transuranic elements have relatively long radioactive half -lives and emit alpha radiation, special considerations are given to the disposal of transuranic waste. While alpha radiation can be shielded by something as thin as a piece of paper, it can pose a health hazard if taken into the body. The Waste Isolation Pilot Plant (WIPP,) has been designed to permanently store transuranic waste to prevent human contact.

How much is there at INEEL?

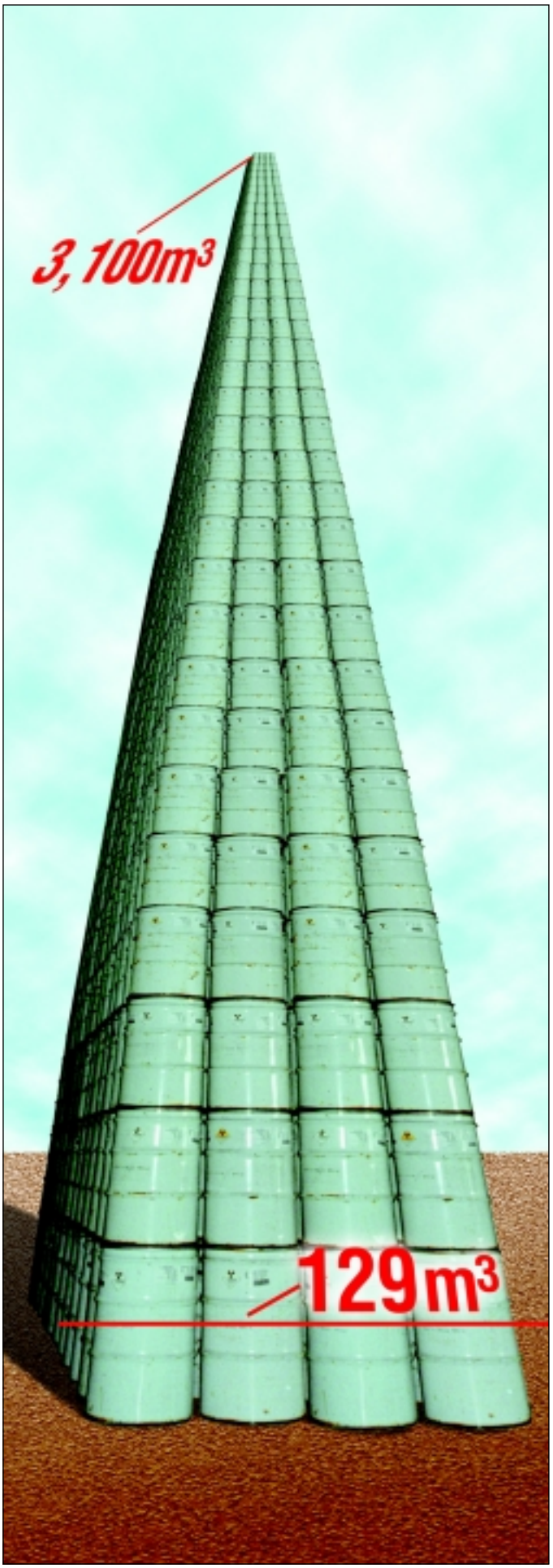
Transuranic waste is measured by volume, in cubic meters. There are 66,000 cubic meters of TRU waste at the INEEL. Of that, 36,000 cubic meters are in storage, and 30,000 cubic meters are buried.

Ninety-five percent of TRU waste stored at the INEEL originally came from the Rocky Flats weapons production facility near Denver.



Where is it going to go?

The Settlement Agreement requires all TRU waste in Idaho will be shipped out of the state. It will go to the Waste Isolation Pilot Plant near Carlsbad, New Mexico.



DOE met its Settlement Agreement requirement to begin shipping transuranic waste out of Idaho by April 30, 1999. The Settlement Agreement also requires DOE to ship 15,000 drum-equivalents (3,100 m^3) by Dec. 31, 2002, and an average of 2,000 m^3 per year until all transuranic waste is out of Idaho—no later than Dec. 31, 2018.

INEEL shipped 26 m^3 in federal fiscal year 1999 (Oct. 1, 1998-Sept. 30, 1999) and 103 m^3 in 2000, for a total of 129 m^3 shipped thus far. INEEL plans to ship 1,160 m^3 of transuranic waste in federal fiscal year 2001 and 1,483 m^3 in 2002. DOE will have to ship the rest of the 3,100 m^3 between October and December 2002 to meet the milestone.

Once the Advanced Mixed Waste Treatment Project begins treating waste in 2003, the shipment rate should pick up. It should streamline how DOE assesses and prepares the various forms, composition and containers of INEEL's transuranic waste.

All's waste that ends waste

Because of changes in waste classifications and gaps in record keeping, estimates of transuranic waste buried at INEEL in pits and trenches prior to 1970 are rough at best. It's also unclear how much soil in the area may be contaminated to the point it qualifies as transuranic waste. Various publications have estimated the combined volume of transuranic and alpha-contaminated low-level waste buried in the RWMC anywhere from 57,000 to 186,000 m^3. The higher estimates make an attempt to include potential volumes of contaminated soil. More accurate estimates can only be determined by further investigation of actual conditions of the pits and trenches.

Estimates for transuranic waste stored aboveground at RWMC also vary. However, there is still some uncertainty because the classification of transuranic and alpha-contaminated low-level waste changed after the waste was created. While the total above-grade waste volume is 65,000 m^3, estimates for the transuranic portion range from 35,000 to 39,000 m^3, and corresponding estimates of alpha contaminated low-level waste range from 30,000 to 26,000 m^3.

Of the 65,000 m^3, approximately 52,000 m^3 (80%) is in drums and boxes stacked on an asphalt pad and covered with soil to form an earthen-covered berm. A metal building encloses this berm. Approximately 13,000 m^3 of the waste (20%) is stacked and can be readily inspected in adjacent RCRA-permitted facilities.

State permit finally in hand, WIPP finally gets cracking

The Waste Isolation Pilot Plant, or WIPP, recently received its 100th shipment. It's a small percentage of the thousands of shipments it will eventually receive, but an important milestone nonetheless. Even more important was the milestone reached on September 27, 1999, when New Mexico's Environment Department issued a hazardous waste permit for the facility. The permit allows WIPP to accept "mixed waste," waste that is both radioactive and chemically hazardous.

Though WIPP had accepted radioactive waste from the INEEL, Los Alamos and Rocky Flats facilities since March 1999, none of the sites could send mixed waste, which is both radioactive and hazardous, to WIPP. An estimated 97% of the TRU waste at INEEL is mixed waste. Under the provisions of the new state permit, mixed waste may be sent to WIPP for disposal, but New Mexico's Environment Department must first certify each site's ability to properly analyze and identify what hazardous materials are in individual containers before further shipments can be made.

After the permit was issued, INEEL spent 10 months changing its TRU management program to meet the permit's requirements. New Mexico certified some of INEEL's mixed waste on July 17, 2000, and shipments resumed shortly thereafter.

Hanford waste travels Idaho highways

Shipments of transuranic waste from INEEL aren't the only WIPP-bound shipments on Idaho highways. WIPP-bound Hanford shipments travel through Idaho on I-84, which enters Idaho just south of Payette and travels through Boise, Twin Falls, and Burley before leaving the state and entering Utah.

Hanford's first shipment of transuranic waste departed for WIPP on July 12, followed by a second shipment on August 2, 2000. Hanford will send an estimated 2,500 shipments (about 80,000 drums) of transuranic waste to WIPP over the next 30 years.

DOE has set stringent standards regarding WIPP shipments. The waste is transported in TRUPACT-II containers which meet Nuclear Regulatory Commission requirements for radioactive shipping containers. Drivers must meet strict experience and driving record requirements.

Trucks are inspected frequently in accordance with safety protocols developed by DOE and the Western Governor's Association. "Trucks are inspected at the point of origin twice; first by the driver who has received certification from a WIPP-specific certification

Oversight Health Physicist Chris Briggs, Rich Wynn of the Eastern Idaho Technical College, and a representative of Jerome County at a mock transportation incident. Each has an assigned role. The controller keeps the event moving. Evaluators provide feedback and suggestions.

The team sets up a decontamination corridor. Anyone leaving the area of the accident is decontaminated. If the contaminant is unknown, the worst is assumed. That's one of the basic safety rules of emergency response.

Below, a firefighter performs a basic radiation survey using a Geiger counter. Response Teams in each region of the state have basic radiation detection instruments, and are trained in the use and maintenance of these instruments.

Radiation detection instruments are also carried by some Idaho State Police, since they are likely to be the first responder on many rural incidents or incidents that occur on highways.

Local responders from all parts of the state can call on Oversight Health Phycisists for technical assistance any time they are dealing with something that could be radioactive. That applies no matter where the item or hazard came from; not just INEEL-related items.

A Jerome firefighter examines shipping papers which detail the load's contents, point of origin, and destination.

Firefighters wearing personal protective equipment receive a briefing before entering the mock "accident" scene. Pre-entry briefings cover safety, what hazards might be encountered, and information that is known about the shipment and the circumstances surrounding the accident.

program, and secondly by a certified team of inspectors," explains Tom Wright, a Hazardous Materials specialist with the Idaho State Police. "And the driver also inspects the truck every 100 miles or every two hours along the route. States may also inspect trucks at ports-of-entry and at random."

Idaho Emergency Response teams, comprised of Idaho State Police, firefighters, and Local Emergency Planning Committees, received special training to prepare for WIPP shipments. "Idaho's extensive hazardous materials awareness program has offered training for responders for years along all transportation corridors," says Wright. "We'll continue to train emergency personnel, and train again when it's needed."

State and local personnel practice and evaluate what they've learned at drills. Drills also test and improve coordination between state and local public safety agencies, including fire crews, police and sheriff departments, and ambulance services.

The Regional Response Hazardous Materials Team from Jerome County, along the I-84 corridor, conducted drills on September 18-19, 2000. The first hypothetical scenario involved a vehicle carrying radioactive material colliding with another vehicle transporting a group of children. The second scenario involved a shipment of radioactive materials crashing into a canal.

"The more we drill and train, the more focused we are as a group," said Jim Auclaire, Jerome City Fire Chief. "We have been pleasantly surprised how well all the agencies worked together. Proper coordination between public safety teams is an essential component of emergency response."

These drills do more than prepare for a possible radiation accident involving a WIPP-bound shipment. According to the Federal Emergency Management Agency, about three million shipments of radioactive materials are made each year, by highway, railroad, aircraft and ship. Almost 55% of the radiological shipments made consist of medical or research materials. Only 14.8% of the shipments contain radioactive waste. Regulations covering all radiological materials strictly control the types of materials that can be carried, amounts, and packaging. All carriers, private and government, are covered by these regulations.

INEEL and Hanford waste bound for WIPP

As of December 2, 2000, WIPP has received 121 shipments. Five were from Hanford, and 28 were from INEEL.

According to current estimates, INEEL will send more than twice as much waste to WIPP than Hanford. The amount INEEL sends may change. Cleanup activities dealing with waste buried at INEEL will likely change estimates for transuranic waste.

In addition, upcoming decisions for treatment and disposal of high-level waste may result in separation of high-level waste. If that occurs, the parts contaminated with transuranic elements may be sent to WIPP.

INEEL waste bound for WIPP 65,322 m^3

Hanford waste bound for WIPP 28,278 m^3